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MORE OBSERVATIONS BY A RELIC HUNTER**(TN-163A)**● ● **from Thomas A. Kays; Alexandria, VA****Compiled and Edited by Associate Editor Gary A. Trudgen**

Patron Kays' first contribution to *The Colonial Newsletter* (CNL) drew the attention of noted numismatic researcher Eric Newman. Appearing as TN-163 in the April 1995 (p. 1488) issue, Kays provided an interesting and knowledgeable commentary on colonial era numismatic finds in the northern Virginia area. Eric wrote Patron Kays, who is a colonial enthusiast and relic hunter, asking for more detailed information, especially on the cut coins that he has found and seen. Patron Kays responded with a wealth of additional information, along with a table and photo plates of several Spanish / Spanish Colonial coins found in Virginia by relic hunters. He also sent a copy to CNL stating that his information was "for publication if Ye Editor wishes."

Colonial era coin finds by relic hunters provide first hand information as to which coin types circulated in various parts of the country. This information is not as scientific as archeology, however, where a recovered coin can often be attributed to a precise time period. Nevertheless, Patron Kays provides useful information on colonial era coin finds along with many interesting insights and observations. Comments found in brackets [] have been inserted by the editor.

"Coins as dug colonial era relics are quite scarce. Soil builds overtop of lost coins at a rate of about 4 inches per 100 years. Most colonial era land has been disturbed by farming and construction leaving very few pristine sites. Most colonial sites are not available to relic hunters by law, private ownership, and lack of knowledge of what once was where. Coins are usually only found where large numbers of people engaged in commerce over long periods of time. Coins are found once out of about every 50 metal objects detected in good colonial sites. The most common coin recovered from colonial Virginia sites is the Lincoln penny. Prime real estate chosen by the Colonists for early settlements tended to remain in heavy use by later generations. For every thirty coins found at a really good site, perhaps one or two were minted in the colonial era. For every four colonial era coins found probably three were actually lost in the early to mid 19th century as evidenced by their extreme wear and their proximity to later date relics. Spanish silver circulated freely in the U.S. from its import through the Civil War. One measure of determining which Spanish Colonial coins circulated in post colonial times might be to study the degree of wear on dated Spanish Colonial coins underlying 19th century tradesman's counterstamps as listed in publications by Dr. Gregory G. Brunk. From the kinds of coins lost during colonial times and found today at colonial sites, Spanish Colonial coins were of preference in equal measure to English regal/counterfeit coppers, usually George II and George III halfpennies which are often found corroded to datelessness."

"I believe hard money was used in colonial times with about the same frequency and for much the same purpose as traveler's checks today. In every day transactions people paid with local barter such as tobacco or paper promises of other future goods on account. Since most people rarely traveled far and most towns were small, everyone knew most every one else's credit worthiness by reputation. Only distant travelers, strangers in town, and the uncreditworthy needed hard money. The kinds of sites which usually produce the most colonial coins are courthouses, taverns, house sites and waypoints along colonial roads and rivers where hard and fast living demanded hard and fast money."

"As the Virginia halfpenny circulated widely from its point of introduction at Williamsburg, greater concentrations of higher grade examples should be expected to be found emanating from Williamsburg through the York River area. So too, varieties of Spanish and Spanish Colonial silver are found unevenly distributed between the Potomac, Rappahannock, and James River areas in Virginia indicating different points and times of introduction. I don't know about finds in the York River area nor areas further south, although I hear that anything is possible in coin finds from

Charleston, SC. The most international and active seaports of colonial times and their main overland trade routes should be prime colonial coin hunting territory. It would be nice to trace back particular shipments of Spanish coins to the colonial city and date of release as you [Eric Newman] did for the 1774 arrival of the ship "*VIRGINIA*" full of Virginia halfpennies to Williamsburg." [See *Coinage for Colonial Virginia* by Eric P. Newman, page 21, The American Numismatic Society, 1956.]

"In general, Spanish Colonial 'portraits' (Carolus III, Carolus IIII), especially 1/2 and 2 real denominations have been found near the Potomac River and especially in the City of Alexandria and Fairfax County. Spanish Colonial 2 reales or 'two bits' traded at 4 to a Spanish milled dollar (8 bits). Spanish 2 reales, called 'pistareens,' were lighter in weight than their Spanish Colonial counterparts and were equal to a shilling or 5 to a Spanish milled dollar. The King of Spain expected to collect the difference as a tax, 'the King's fifth' whenever Spanish Colonial coins entered their mother country."

"Cut and sometimes whole, higher grade Spanish Philip V 'cross pistareens' {see coin D}, many dated between 1722 - 1724, and less frequently whole or cut half pistareens of later dates are found around the Rappahannock River and especially in the City of Fredricksburg, and along colonial trade routes west, as far north as Dumfries in Prince William County and in Fairfax County. The first cut of a pistareen to make 'frontier change' is about equal as to top/bottom halves versus right and left halves with quarter sections twice as common as halves (of course this stands to reason) and eighths less common than halves or quarters. Thirds and other fractions are generally unknown. The 'cross pistareen' seems intentionally designed for cutting along the cross into halves and quarters and is usually found in pieces. Very rarely are they found grossly miss cut. Few other coins are found cut. Cut quarters of Mexican or Potosi pillar 2 reales are found about once for every eight cut Spanish 'cross pistareen' sections found. 'Portraits' are never found cut."

"Peru Cob 1 reales have been found near Richmond {see coins S, T}. Contemporary counterfeit Spanish Colonial silver is very scarce with examples being crudely handcut, but artistic, lead, cast Carolus III 8 reales (1772 {see coin F} and 1781) being the most notable that I have seen dug. Whole coins are holed for suspension about a third of the time. Some colonial vintage holes are crude square nail punches {see coin K}, but most holes are found round. I believe the practice was to tie holed coins together and sew strings of coins into linings of coats to be used as a travelers mad money. I have seen Spanish Colonial coins made into cuff buttons (1734 Philip V 1/2 reales) which may have been a Victorian practice, and 'portrait' 2 reales cut into gears for clocks and centerpunched for use as rowels in a pair of Civil War era Texas spurs."

"I will discount as post-colonial many extremely worn examples, usually Mexican 1/2 reales of Carolus III, which probably were lost after sixty to eighty years of circulation according to their deplorable condition. They are frequently found in Civil War camp sites alongside seated liberty half dimes. These picayunes [a term applied to Spanish Colonial 1/2 reales indicating trivial value] were popular in New Orleans and probably traveled in Civil War soldiers pockets up to the many battlefields of Virginia. They are found with frequency in all areas of northern Virginia. They are often found in paper thin condition and look like they have been chewed on by animals. This may be a long term reaction to lime or some other farm chemical dumped in plowed fields. A quick survey of my junk box shows ten from Mexico: two dateless Carolus III, two 1780, a 1781, 1782, 1784, and two 1785. Also included is an oddball dateless Philip V 1/2 reale from Madrid. Four are holed for suspension. I have seen at least a hundred of these 'dogs' in dug collections. Numismatically speaking they have attained the lowly rank of relic rather than coin."

"With respect to denomination, the diminutive 1/2 reales are lost and found most often followed by 2 reales or their cut parts and then 1 reales. I know of no 1/4 reales ever found. Larger denominations are not lost casually. No colonial context 4 reales have been found with the possible

exception of a 1769 Mexico pillar purportedly found in dredge material from the Chesapeake Bay (see pictured coin A). Bolivian 'portrait' 4 reales of Carolus III have been found in two different Civil War Texas camps. The two examples I know of were found in small caches. One cache was deliberately buried about 1832 and held a Bolivian 4 reales and eight U.S. half dollars dating from 1803 to 1831 with an 1830 and two 1831 U.S. halves in near uncirculated condition. The other Bolivian 4 reales was found in the remains of a leather coin purse at a Texas camp in Gordonsville, Orange County (see pictured coin E). I know of no genuine 8 reales lost in colonial times being found in context with the possible exception of the 21 high grade portrait 8 reales, circa 1772 - 1808, found together at a mill site as previously described in my first CNL letter."

"The story behind two 'found' Carolus III, Mexico 8 reales, (a 1791 with Chinese chop marks {see coin C} and an 1803 with lots of wear {see coin B}) were said to have come from the foundation of an old building in Alexandria back in 1929. The building is no longer there and the boy that found them held on to them as good luck items, selling them 65 years later. I know of no Spanish nor Spanish Colonial gold discovered in Virginia. Some unsubstantiated possibilities include a Portuguese Johannes V 400 reis and several Seville 1/2 escudos of Carolus III which turned up at a relic show without any verification as to where they were found. Counterfeit English spade guineas are sometimes found and perhaps several genuine examples too, such as the funny looking rose guinea on display at George Washington's Mount Vernon which came from an excavation at his private dock."

List of Pictured Spanish / Spanish Colonial Coins

"All pictured coins were recovered by reputable relic club members on private property with the permission of the land owner over about the last ten years. Many were recovered behind the bulldozers of progress in northern Virginia which can expose colonial relics on the first sweep and on the next sweep wipe them out for all time. The colonial era soil horizons for coins in this group no longer exist. This group represents many of the better finds I have seen, but few of the exceptional which are rarely offered for sale."

ID	Date	Type	Denom.	Mint	Assy.	Cond.	Area Found
A	1767	Pillar, with water damage	4R	Mo	MF	VF-	Chesapeake Bay dredge?
B	1803	Carolus III, with heavy wear	8R	Mo	FF	VG	Alexandria building in 1929
C	1791	Carolus III, with Chinese chop marks	8R	Mo	FM	F+	Alexandria building in 1929
D	1722	Cross pistareen	2R	Seville	J	VF+	Fredricksburg
E	1807	Carolus III, with dark leather tone patina	4R	PTS	PJ	F	Gordonsville in coin purse in Texas Civil War camp
F	1772	High quality handcut lead counterfeit with good rim design	8R	Mo	FF	Lead	Fredricksburg
G	1739	Pillar, hit by shovel	2R	Mo	MF	VF	Dug location unknown

ID	Date	Type	Denom.	Mint	Assy.	Cond.	Area Found
H	1769	Pillar, with crude hole	2R	PTS	JR	F	Fredricksburg
I	1808	Carolus III, off center	2R	Mo	TH	XF	Alexandria from house on Cameron St.
J	1801	Carolus III	2R	ME	IJ	F	300 block South Lee Street, Alexandria
K	1789	Carolus IV, with square nail hole	2R	ME	IJ	F	Fredricksburg
L	1780	Carolus III	1R	PTS	PR	VG	Fredricksburg
M	1799	Carolus III, struck through wire	2R	Mo	FM	XF	Alexandria
N	1780	Carolus III	2R	Mo	FF	F	Fredricksburg
O	1775	Carolus III	2R	ME	MJ	F	Fredricksburg
P	1787	Carolus III	1R	ME	MJ	VG	Fredricksburg
Q	1732	Half a cross pistareen, with swamp tone patina	1R	Madrid	IF	F	John's Island, South Carolina
R	1721	Half a cross pistareen	1R	Seville	IJ	F	Culpeper
S	1742	Cob	1R	Peru	P	F	Richmond, along the Chickahominy River
T	1729	Cob, "two dates," had contact with iron	1R	Peru	Y	VF	Dunkirk, near Richmond along the Pamunkey River
U	1754	Pillar, Ferdinand VI	1/2R	Mo	M	XF	Richmond, along the Chickahominy River
V	1782	Carolus III	1/2R	Mo	FF	VG	Fredricksburg
W	1785	Carolus III, with square nail hole	1/2R	Mo	FF	VG	Fredricksburg
X	1739	Pillar	1/2R	Mo	MF	VF	Dug location unknown
Y	???? circa 1760- 1770	Carolus III, upper left quarter of new world pillar 2R	2R cut to 1/2R	??	??		Fredricksburg
Z	1737	Pistareen, upper right quarter	2R cut to 1/2R	??	??		Fredricksburg

ID	Date	Type	Denom.	Mint	Assy.	Cond.	Area Found
AA	1718	Half pistareen, top half, green patina	1R cut to 1/2R	??	??		Halifax Road, Portsmouth
BB	172?	Half pistareen, left half	1R cut to 1/2R	Seville	J		Virginia
CC	????	Philip V half pistareen, lower half	1R cut to 1/2R	Sego via	F		Fredricksburg

Recent Notables (Photos Not Available)

"I have been approached to identify dug Spanish / Spanish Colonial coins for others at shows during the last year which were either not for sale or offered for too darn much. They are:"

- "1767 pistareen, Madrid, 'PJ', AU: From a colonial crossroads at Haymarket which is now under a new townhouse development. It was found within two feet of a 1915 quarter by a rather surprised novice hunter."
- "1724 pistareen, Seville, 'J', UNC: Still with planchet curvature from roller die process and mint luster, Fredricksburg area."
- "1724 pistareen, Seville, 'J', AU: Slight hit with shovel, Fredricksburg area."
- "About a dozen various Philip V cut pistareen quarters, with one 1/8 sliver, from a large collection of artifacts recovered from colonial sites now bulldozed around Dumfries."

A short list of colonial coins that are just not found in Virginia per my observation:

- 1) "Any coin dated before 1700 (most believable exception: English coins from along the James).
- 2) Spanish or Spanish Colonial gold escudos, all denominations.
- 3) French colonials (all types).
- 4) Portuguese colonial era coins.
- 5) German States coins (they are supposed to be found in Bladensburg, MD and parts north).
- 6) Dutch colonial era coins.
- 7) Spanish Colonial rarities (monetary value over \$100) due to scarce mint, type, or variety.
- 8) Counterstamped Spanish colonials (all kinds).
- 9) Spanish copper maravedis and silver 1/4 reales.
- 10) Any colonial with George Washington's picture on it.
- 11) Most of the other "colonial" coins listed in the *Red Book* with the exception of Virginia halfpence, Wood's Hibernia coinage, Connecticut and New Jersey state coppers, in descending order of occurrence."


"Exceptions to the above may be dug on a one-of-a-kind basis but generally do not contradict the fact that the above coins did not circulate in Virginia as evidenced by what is found. Large size and large face value coins may have circulated more than indicated by the quantity of coins found but they would have been searched for with much more diligence and found more often by the potential loser." 

Photo Plate of Spanish / Spanish Colonial Coins



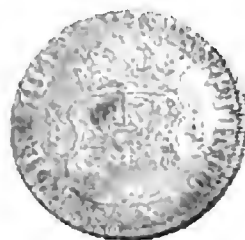
A - 1767 4R Pillar



B - 1803 8R Carolus III



C - 1791 8R Carolus III



D - 1722 2R Pistareen



E - 1807 4R Carolus III



F - 1772 8R Carolus III



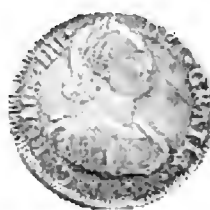
Photo Plate of Spanish / Spanish Colonial Coins



G - 1739 2R Pillar



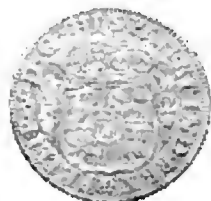
H - 1769 2R Pillar



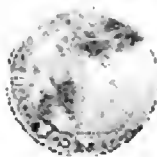
I - 1808 2R Carolus III



J - 1801 2R Carolus III



K - 1789 2R Carolus IV



L - 1780 1R Carolus III



M - 1799 2R Carolus III



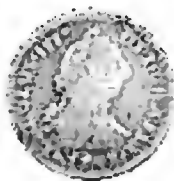
N - 1780 2R Carolus III



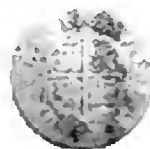
Photo Plate of Spanish / Spanish Colonial Coins



O - 1775 2R Carolus III



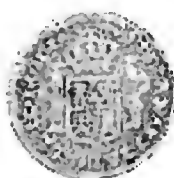
P - 1787 1R Carolus III



Q - 1732 1R Pistareen



R - 1721 1R Pistareen



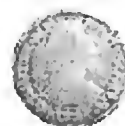
S - 1742 1R Cob



T - 1729 1R Cob



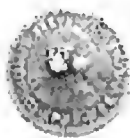
U - 1754 1/2R Pillar



V - 1782 1/2R Carolus III



Photo Plate of Spanish / Spanish Colonial Coins



W - 1785 ½R Carolus III



X - 1739 ½R Pillar



Y - Circa 1760 Cut 2R Pillar



Z - 1737 Cut 2R Pistareen



AA - 1718 Cut 1R Pistareen



BB - 1722 Cut 1R Pistareen



CC - 1722 Cut 1R Pistareen



A QUANTITATIVE CLASSIFICATION SYSTEM FOR STRIKE ERRORS

by

Charles W. Smith, Ph.D.; Orono, ME

(TN-171)

I. INTRODUCTION

Having recently had the opportunity to examine several hundred error coins of the British George III contemporary counterfeit halfpenny series,¹ it became clear that a uniform quantitative error classification system would be useful for all who catalogue and/or collect error coin examples. Production errors can occur at each step in manufacturing a coin, from sinking the dies and punching the blanks, to striking the coin itself. It is this last step, the strike, that is the subject of this article.

Well over 90% of all strike errors fall into four categories: die-rotation, off-strike, brockage, and double-strike.² For a strike error classification system to be useful, it must satisfy two criteria: simplicity and sufficiency. SIMPLICITY means that the choice of descriptors used to classify each error type must be a minimum set of variables necessary to do the job and that these variables must be easy to measure. SUFFICIENCY means that the set of variables employed must provide a unique description of each particular error coin example, that is, once values are assigned to the variables, an unambiguous image of the error coin example can be accurately visualized. Using nothing more than a ruler and a protractor, the following classification system for strike errors proves to meet these criteria.

II. THE ERROR CLASSIFICATION SYSTEM

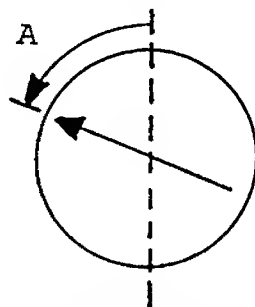
1. Die-Rotation Errors [A]. This section describes a quantitative error classification system that encompasses all the major strike error types. The die-rotation error is described using one variable, A, the relative angle of rotation of the reverse die. A is defined with respect to the proper coin orientation of the reverse device, in the following way. The coin is first viewed with the obverse side up and the obverse device correctly oriented. The coin is turned over 180° about its horizontal diameter. In proper coin orientation the reverse device should be correctly oriented after this 180° turn.³ Departure from proper coin orientation of the reverse device is measured in degrees counterclockwise with respect to the vertical diameter of the coin. Counterclockwise is chosen to agree with the primary angular sense use in mathematics. The vertical axis is chosen

¹ "The English George III Contemporary Counterfeit Halfpenny Series: A Statistical Study of Production and Distribution," Charles W. Smith, *Coinage of the Confederation Period*, edited by Philip L. Mossman, Proceedings No. 11 of the Coinage of the Americas Conference, The American Numismatic Society, to be published, 1996.

² The figure, 90% applies to the British George III contemporary counterfeit halfpenny series, only. To my knowledge, a statistical error analysis has not been carried out, per se, for the other 18th century coppers series.

³ The proposed error classification system can also be used to document struck medals and medalets. The only modification being that for proper medal orientation, for example a military medal suspended from a ribbon, the reverse device should be correctly oriented after a 180° turn about its vertical diameter.

since it coincides with the proper coin orientation for the reverse device.



Measured from
Vertical Axis

[A]



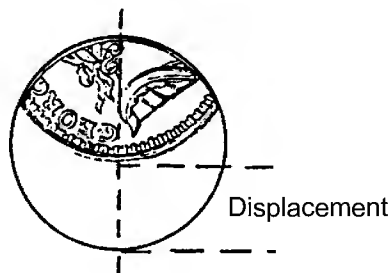
Reverse after Turn Over
from Obverse Position
[45°]

DIE-ROTATION

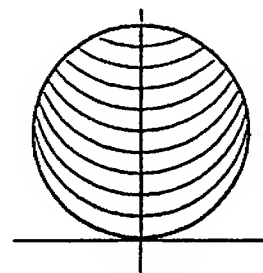
FIGURE 1

2. Off-Strike Errors [D,A]. A coin struck partially off the blank can be described using two independent variables, D and A. D is the displacement of the edge of the struck area from the edge of the blank. D is measured along the diameter that bisects the struck area and is specified as a percentage of the diameter. A, the angular orientation of the struck area, is specified using the obverse device and is measured in degrees counterclockwise with respect to the diameter that bisects the struck area.

3. Brochage Errors [D,A,T]. A brochage is described by three independent variables, D, A, and T. A brochage occurs when a coin is struck but not fully ejected from the press (perhaps it sticks, unseen, to the upper die) and a blank is fed in and struck between the minted coin and the free die. A brochage can be thought of as a special type of off-strike error, for which one of the impressions is incused (the impression made by the stuck coin). Any displacement of the edge of the incused area with respect to the edge of the blank, D, and the orientation of the incused area, A, with respect to the diameter that bisects the incused area, are specified in the same way D and A are specified for the off-strike error. T is the type of brochage and is either an obverse type, O, or a reverse type, R, depending on which face is the incused area. Note, the incused area will be a mirror image of the portion of the minted coin that produced it.



Bisecting
Diameter



10° Displacements

MEASURING DISPLACEMENT

FIGURE 2

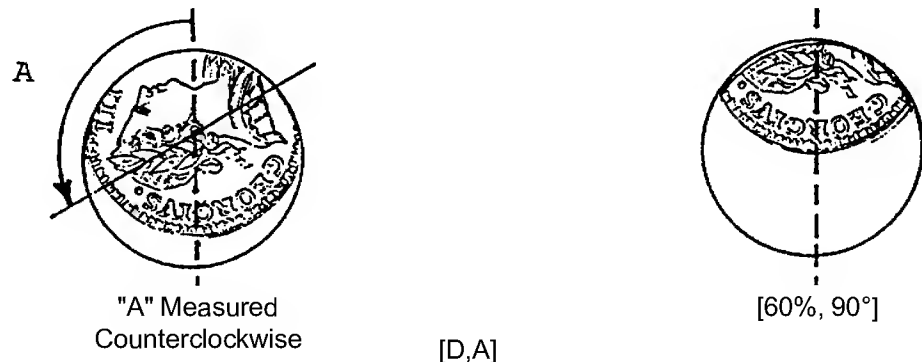
**OFF-STRIKE**

FIGURE 3

**BROCKAGE**

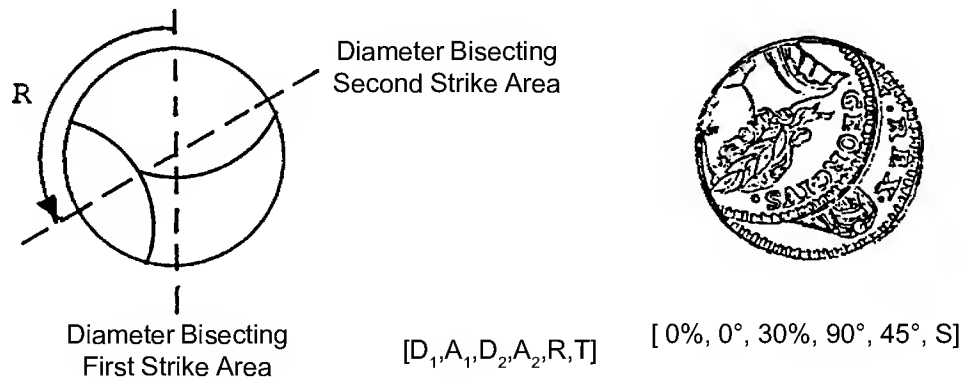
FIGURE 4

4. Double-Strike Errors $[D_1, A_1, D_2, A_2, R, T]$. Six independent variables are needed to classify all possible double-strike errors. A double-strike error involves two impressions on the blank and each can be thought of as an off-strike error in that a displacement, D , and an angular orientation, A , are required for classification. In addition, the second strike area (the overstrike) may be rotated with respect to the first strike area (the understrike), hence R , the rotation of the second strike area with respect to the first strike area, must also be specified. The type of double-strike error, T , takes the value S if the obverse is on the obverse or the reverse is on the reverse and F if the second strike is flipped with respect to the first strike. Although this classification category seems elaborate, it is sufficient to describe even the most complicated double-strike errors.⁴ In practice, however, the double-strike error is generally not much more complicated than the off-strike error, since in the vast majority of cases, the first strike is centered on the blank thus making D_1 and A_1 both zero by simple inspection.

For uniformity in measuring double-strike errors, the following procedure is suggested. The coin to be measured is initially oriented with the first strike obverse device facing up and the diameter

⁴ The most complicated double-strike error is the uncentered rotated flip-over double-strike, for which a portion of the obverse device and a portion of the reverse device appear on both sides of the coin, the second strike area being rotated with respect to the first strike area and neither strike centered on the blank.

that bisects the first strike area, vertical. It turns out this is always possible. D_1 and A_1 are measured in the usual way. The second strike area is located and the diameter that bisects the second strike area determined. D_2 and A_2 are measured in the usual way. R , the rotation of the second strike with respect to the first strike is measured in degrees counterclockwise, from the diameter used to measure D_1 and A_1 , to the diameter used to measure D_2 and A_2 .



DOUBLE-STRIKE

FIGURE 5

In practice an easy way to measure R is to lay the coin on a piece of paper and draw the two bisecting diameters using a transparent ruler, taking care not to move the coin in the process. Next, remove the coin from the paper and complete the lines. Finally, measure R with a protractor counterclockwise from the first bisecting diameter to the second bisecting diameter.

Strike errors are rare and most are one-of-a-kind errors.⁵ It is worth the time it takes to measure strike errors, not only to complete the documentation of error examples in a particular collection, but eventually to produce a uniform quantitative data base from which production technologies and mint practices can be inferred. For example, in the British George III counterfeit halfpenny series, off-strike errors are relatively scarce as an error type. That observation, taken together with the fact that 90% of all brockages in that series are full brockages, suggests that some type of centering fixture was employed in the blank fed step. Whether die clash errors are common or uncommon in a particular coin series may imply that the coin presses employed could be equipped with a displacement stop to limit the excursion of the upper die, in the absence of a blank. These two types of observations relate to production technologies. In a different sense, when we notice, in a particular coin series, the common occurrence of flip-over double-strike errors for which the second strike (the overstrike) is perfectly centered and the first strike (the understrike) is substantially off center, we can infer a mint practice, namely, putting off-strike errors, when noticed, through the press a second time.

How will we discover these production technologies and mint practices if written records of the period do not exist and extant press examples are incomplete or substantially modified? There is an answer to this question. Fortunately, we have coin error examples to measure. The clues

⁵ The die-rotation error may or may not be a one-of-a-kind error. Technically it is a press loading error, unless it is caused by one of the dies coming loose in the press vise and reorienting slightly with each strike. As a press loading error one can imagine many coins struck with the same $[A]$ value before it is discovered and corrected.

to these puzzles come from the coins produced when things went wrong at the mint, not from the perfectly centered and well-struck examples.

Once convinced of the importance of measuring error coin examples using a uniform quantitative error classification system, the question of how careful should one be in these measurements still must be addressed. This is a question of precision and practicality.

III. PRECISION AND PRACTICALITY

For any measurement, precision and practicality are closely related. Precision is an indication of the range of values obtained when a measurement is repeated again and again. It is related, among other things, to the resolution of the measuring instruments employed and the measurement technique itself. Practicality has to do with the purpose of the measurement, that is, the application for which the measurement is intended. Often a compromise between precision and practicality is desirable.

For several reasons, which will become obvious, even simple numismatic metrology has its compromises. Since the measurement of displacement, D , and angular orientation, A , are basic to strike error classification, we will use the off-strike error to illustrate precision and practicality. The precision of this measurement is limited by our skill in placing the ruler along the diameter that bisects the struck area, our ability to locate the actual edge of the struck area, and the fact that the off-struck coin is not circular. Placing the ruler along the diameter that bisects the struck area turns out to be easy using a transparent ruler. Locating the position where the edge of the struck area crosses the ruler is a little more problematical. The edge of the struck area is often blurred by metal flow caused by the pinching action at the edge of the die. This is because the unsupported portion of the blank tends to squeeze away from the portion clamped between the dies. The result is poor definition of the edge. As a guideline, it is helpful to use the circumferential design on the coin rather than the actual edge of the pinch. If a die feature like denticles or a circumferential ring are absent, use a similar non-error coin as a guide to locate the edge. Measuring the diameter is best not done along the bisecting diameter since off-strike errors tend to elongate the coin in that direction. Use a more representative diameter. It is my experience that with some practice D can be dependably estimated to the nearest 5%. A , the angular orientation of the struck area is specified with respect to the diameter that bisects the struck area. A very simple way to measure A is to place a similar non-error coin on the struck area, orient this coin along the bisecting diameter, and then rotate the coin counterclockwise until its design details align with the design details of the struck area. A is the angle of rotation required to bring the non-error coin into coincidence with the struck area. With some practice, A can be estimated to the nearest 10° .

Working to these tolerances can be a challenge, especially in the case of the double-strike error for which there are two images on the blank. However, I have found the following strategy helpful. As previously mentioned, in the vast majority of cases, the first strike is centered on the blank. Thus we initially position the coin so the obverse of the first strike is properly oriented; this makes D_1 and A_1 zero, and places the bisecting diameter for the first strike vertical. Next, the bisecting diameter for the second strike is located and R is measured, counterclockwise from the bisecting diameter of the first strike to the bisecting diameter of the second strike. D_2 is measured in the usual way and A_2 is measured by rotating a non-error coin counterclockwise from the second bisecting diameter. T is filled in by inspection. When more complicated double strikes are encountered, follow the same steps; namely, orient the coin, obverse up, with the first bisecting diameter vertical and measure D_1 and A_1 . Next locate the second bisecting diameter and measure R , D_2 , and A_2 , in that order. Finally, fill in the double-strike type, T .


A word about angles: since one of the objectives of this strike error classification system is to provide a quantitative description with unique specificity, a selection of angular sense (clockwise or counterclockwise) must be made for A_1 , A_2 , and R . This has been accomplished by choosing to orient the error coin, obverse side up and to measure all angles counterclockwise. These choices assure uniqueness. However, there are cases for which it is more practical to use the reverse device, for example if its definition is superior to the obverse device. To accommodate these situations and at the same time preserve uniqueness, when the reverse device is employed, then A_1 , A_2 , and R should be measured clockwise from the 6 o'clock position of the bisecting diameter. This gives the same angle values one would obtain using the obverse device and measuring A_1 , A_2 , and R counterclockwise from the 12 o'clock position of the bisecting diameter.

IV. CONCLUDING REMARKS

A classification system is proposed which encompasses the four most common strike-errors: die-rotation, off-strike, brockage, and double-strike. The system is quantitative and its specificity is unique. All variables used to describe error features are measurable with either a ruler or a protractor, together with a short set of procedures. Whether this system proves useful for research or cataloguing purposes is yet to be determined. At first glance it seems complicated, especially for the double-strike error. However, it can be shown mathematically that for each error type, the proposed classification system uses the minimum number of variables that assure a unique description. In other words, if we want to take the step from a qualitative description (for example, a photograph) to a quantitative description, I am afraid we are stuck with the above system, or a very similar version of it. For many purposes, a qualitative description (a photograph) is more than adequate, i.e. insurance identification or an entry in an auction catalogue. However, for research purposes, numerical ranges, statistical distributions, and average values play important roles in our detailed understanding. An old scientific adage states, "To measure is to know." Perhaps the time has come to take a quantitative measure of our numismatic heritage.

AUTHOR'S NOTES

I have chosen to illustrate this article using line drawings rather than photographs. Line drawings bring a superior clarity that emphasizes the definitions and measurement concepts being presented. Line drawings also provide flexibility in constructing figure examples that are not clouded by extraneous issues like lighting angle and exposure. In the end, however, there is no substitute for measuring a real coin, especially when strike quality, blank flaws, and surface discoloration conspire to work their mischief.

I wish to thank Philip L. Mossman, Eric P. Newman, and Mike Ringo for their comments and suggestions. 

APPENDIX A: EXTENSION OF THIS CLASSIFICATION SYSTEM TO OTHER ERROR TYPES

The above classification system is general enough to accommodate other types of errors. The off-strike error which also exhibits a reverse die rotation can simply be noted, $[D, A_1][A_2]$ where $[D, A_1]$ describes the off-strike and $[A_2]$ the die-rotation. A triple strike can be classified, $[D_1, A_1, D_2, A_2, R_2, D_3, A_3, R_3, T_2, T_3]$ where R_2 is the orientation of the bisecting diameter of the second strike with respect to the first strike and R_3 is the orientation of the bisecting diameter of the third strike with respect to the first strike. T_2 and T_3 are the strike types for the second strike with respect to the first strike and the third strike with respect to the first strike.

Blanking [planchet cutting] errors can also be classified using the above system. To give blanking errors an identification distinguishable from strike errors, we simply put the letter corresponding to the blanking error type in first position, i.e., $[T, D, A]$. Here an incomplete blank with a clip or missing crescent area is denoted C, an incomplete blank with a flat edge is denoted E, and an unsuccessful cut through, as evidenced by a circular shaped cutter mark, is denoted M. D is the displacement of the blanking error measured along the coin diameter which bisects the error shape and is expressed as a percentage of the coin diameter. A is the orientation of the blanking error on the coin obverse. A is measured in degrees counterclockwise from the coin's vertical diameter in proper obverse orientation, to the diameter bisecting the blanking error.

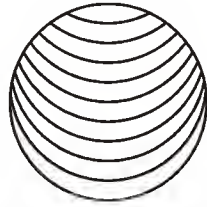
APPENDIX B: TOOLS FOR MEASURING D AND A

As described above, all measurements used in this error classification system can be made with a conventional transparent ruler and a protractor. However, to further encourage a quantitative approach to error analysis, a special percent off-strike ruler and special protractors are shown on the next page. At your local copy store, have a clear plastic copy of this figure made to scale. Cut out these various tools. **Note:** mm equals millimeters.

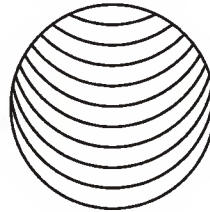
To use the percent off-strike ruler, first center it on top of the coin with the diameter line bisecting the error area. The circular arcs are laid out in 10 percent intervals along the diameter. D is read directly in percent using this ruler.

Two protractors are laid out in 10 degree intervals, on concentric circles, to facilitate centering. These protractors can be used either on top of the coin or under the coin for measurement of A and R. Two other protractors are provided; one laid out in 30 degree intervals and the other in 45 degree intervals.

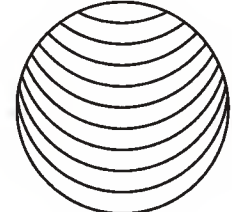
Off - Center Measurement Tool



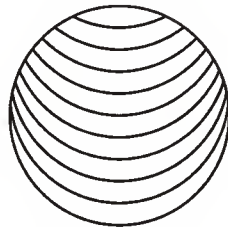
26 mm



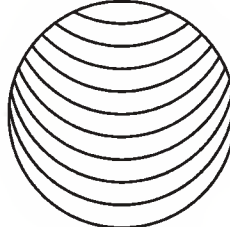
27 mm



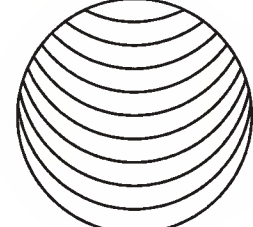
28 mm



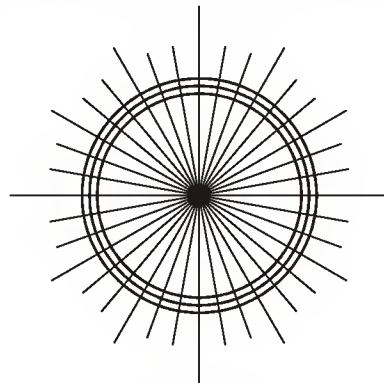
29 mm



30 mm

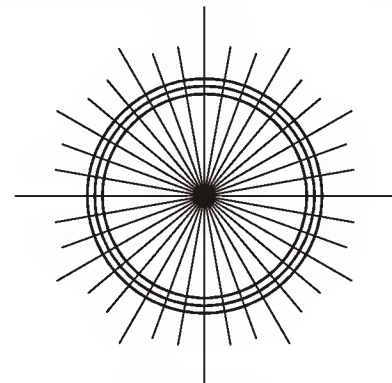


31 mm

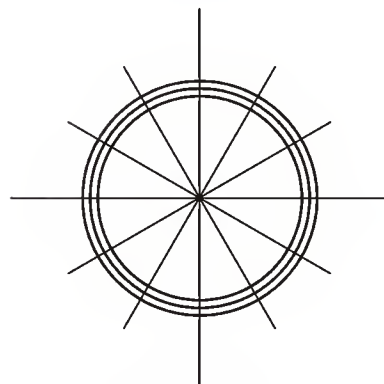


10° Intervals

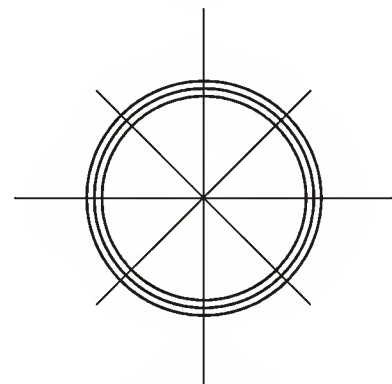
Protractors



10° Intervals



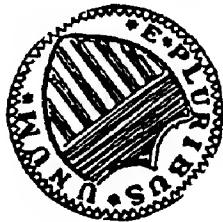
30° Intervals



45° Intervals

APPENDIX C: AN ERROR SAMPLER

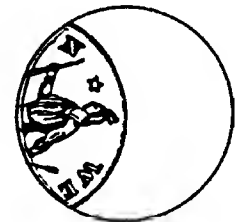
Several reviewers of this article suggested it would be both instructional and enjoyable to conclude with a selection of error examples. Being a university professor, I cannot pass up an opportunity to give a "homework assignment;" so here goes. The "answers" with full discussion for each error example will be presented in a subsequent article.



A



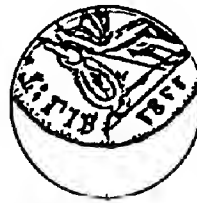
B



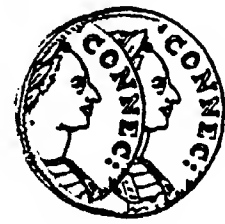
C



D



E



F



G



H



I

IN SEARCH OF...

(TN-172)

REUBEN HARMON'S VERMONT MINT AND THE ORIGINAL MINT SITE

● ● from Rob Retz, Jeff Rock and Dick Thies

The day after the Stack's auction in June, 1994, three colonial nuts went out in search of numismatic history. Our goals were to examine the Connecticut coppers in the collection of the Connecticut State Library for a day and then drive over the Green Mountains to view the Vermont coppers in the collection of the Bennington Museum. If we had the time—and you just knew we'd make time!—we were going to try to track down the probable site of Reuben Harmon's mint, the one responsible for many of the Vermont coppers.

Gene Kosche, the gracious retired curator of history at the Bennington Museum, arranged for us to view the collection and take notes and then casually dropped a bombshell on us. "Have you folks been over to see the mint building?" Three dumbfounded stares answered his question and a few minutes later one of us recovered our senses enough to blurt out that all accounts of the building indicated that it had been destroyed in a storm nearly 150 years ago. "Nah, it's over on Bob Graf's farm—everyone 'round here knows about it. You really ought to see it."

Talk about waving a red flag in front of some copper bulls! Early the next day, with plenty of sunlight to help, we headed north out of Bennington. About half an hour later we passed through the town of Dorset on Highway 30. This is the "main road leading from Dorset to Pawlet" mentioned in Crosby, and appears to follow roughly the same path as it did two centuries ago. Just north of Dorset we crossed over the Pawlet River. We were on Reuben Harmon's home turf, and we were getting close. About half a mile further we crossed a small creek and struck paydirt. This is the "small stream of water called Millbrook" that Harmon used to power his rolling mill.



Continuing towards Pawlet we passed the Graf place, called Southwind Farm, made a quick U-turn and pulled into the driveway. Bob Graf was out of town, but his son-in-law was mowing the lawn and came over to talk to us. We asked about the mint building and with a hearty laugh he said "You want to see old Harmon's mint? It's right over here." He led us to a small garage just off the main driveway and said "You guys look around all you want. I've got to finish the yard, so just turn out the light when you're done."

Alleged Harmon Mint
Rear of Building Facing East



Alleged Harmon Mint
Main Center Beam

The building itself looked promising. While the roof and siding were old they certainly weren't more than three or four decades in age, and the cement floor was probably not what Reuben Harmon would have put in. The frame of the building, however, was of a much earlier vintage—rough hewn and assembled by mortise and tenon—and almost certainly late 18th century. We paced out the size of the building, figuring it at roughly 16 by 20 feet, a pretty close match to Crosby's description of "about 16 by 18 feet." The age, size and structure of the building fit what we knew about the mint, and local lore has ascribed it as the mint building for at least the last century, usually with that special New England flair that mixes pride for their history and extreme surprise that anyone else should care.

We took wood shavings from the beams on both the first floor and the attic for later chemical analysis, figuring that if copper smelting had gone on in the building over a period of time, the wood should have absorbed metal from the fumes. The results of the chemical analysis is presented on the next page.

Unfortunately, guns rarely smoke 200 years after they've been fired, and the results of the analysis are inconclusive at best. Copper appears at only .0014%, a level far below what would be needed to prove that smelting had actually occurred. The table does have one surprise in that the high levels of tin found (.2%) indicate that some sort of metal work could have been carried out in the building at some time.

There are a number of possibilities for the inconclusive results of the chemical analysis. The original beams could have been stripped when the building was moved from the mint site or they could have been sanded down enough to remove the trace metals (which would not have penetrated deeply into the wood). There is also the possibility that the actual copper smelting occurred in a different building from the one in which the coins were struck (a logical possibility as the smelting fumes would have been quite noxious, making it difficult for workers to strike coins). It also has to be remembered that the building itself is over two centuries old and whatever uses it has had in that period of time could have affected the results of the chemical analysis.

Circumstantial evidence, however, does hint that this might actually be the building in question. The letter reprinted in Crosby (on page 190) represents just about all we know about the travels of the original mint building. Of interest in that letter is the statement that "Its third removal was to a spot north of the house of John Harwood, Esq., in the town of Rupert, on the east side of the main road." Although contemporary property owner maps (usually for tax assessment purposes)

**CHEMICAL ANALYSIS OF WOOD SHAVINGS
TAKEN FROM SUSPECTED RUPERT, VERMONT MINT BUILDING**

<u>Element</u>	<u>Concentration in Sample From First Floor</u>	<u>Concentration in Sample From Attic</u>
Copper	0.0014%	0.0013%
Zinc	0.0054%	0.0038%
Iron	0.046%	0.020%
Lead	0.0045%	0.0077%
Tin	0.2%	0.04%
Cadmium	< 1 ppm	< 1 ppm
Nickel	< 4 ppm	< 4 ppm
Silver	< 2 ppm	< 2 ppm

The sample from the bottom floor was taken from the large crossbeam. Samples consisted of shavings approximately 1 mm in thickness.

(Element Weight/Total Weight) x 100 = %

Parts Per Million = ppm

either do not exist or weren't available, *Beers' Atlas of Bennington County* for 1869 (the earliest we found) shows a pair of residences for an S. Harwood and a B. Harwood. A few sentences later the letter reprinted by Crosby states that the fourth location of the mint building was "...on the farm of William Phelps about a mile north of John Harwood's residence in 'the edge' of the town of Pawlet." The same map shows residence listings for both a J.W. Phelps and a J.K. Phelps. Although circumstantial, the map does show that these two families were in the area where the building in question still sits.

With the distinct possibility running through our minds that we had found the original mint building, we left the Graf farm (after turning out the lights) and headed back towards Dorset to see if we could find the original mint site—kind of a numismatic double header.

Where the small stream Millbrook crossed the road it was barely ankle deep and about five feet wide, meandering across the flat land on its way to joining the Pawlet river. The mint site was described in Crosby (from a letter from B.H. Hall to Charles Ira Bushnell dated March 3, 1855), as being located "a little east of the main road." A 200-yard trek upstream, at first through the water and then through an unplanted field, led to an abrupt rise in the terrain. From here the brook cut through a steep gorge of shale. The mouth of this gorge, about 200 yards from the road, appeared to be a natural—and perhaps the only—spot that the stream could be dammed up to harness the water power.



Alleged Harmon Mint
Hewn Ceiling Joists

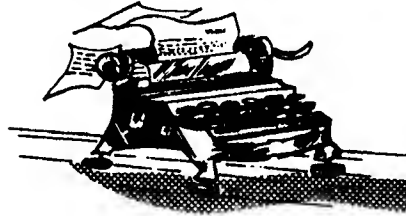
Remains of what might have been a dam could be seen, but clearly no man-made evidence could be located. Tantalizingly close, but again, no smoking gun. We spent about two hours searching the area with a metal detector, hoping to locate at least a few landscape Vermonts (or an original die or two!), but only came up with a few broken bits of pottery and a rusted metal ring about two inches in diameter, probably from some type of horse's tack.

As the sun was beginning to set we headed south back towards Bennington. Looking up at the mountains we all realized that the landscape Vermonts are not the stylized depiction that collectors assume them to be, but are rather a pretty accurate picture of the view from Reuben Harmon's own land. Gazing up at their majestic beauty, it was easy to understand why the Green Mountain Boys emerged over two centuries ago and fought for their property.

In the end, we all agreed that everything looked right: if we were going to plan a mint, the building on Bob Graf's farm would have been perfect for the job, and we would have chosen the place at the mouth of the canyon where Millbrook descended from the mountains. We also began to wonder if Sylvester Crosby ever spent a sunny weekend afternoon wading up a river! **CNL**



Editor's Notebook



Thank you!

The purpose of this message is to explain the reasons for my retirement as editor of The Colonial Newsletter (CNL) and to offer my very sincere thanks to all of our Patrons who have so unselfishly donated their talents and their support to the efforts of The Colonial Newsletter Foundation (CNLF) and to CNL. To each and every one of you - - Thank You!

In January of each year - since 1963 - ye Editor has reviewed the progress of CNL in terms of the number of Patrons and their level of participation, the availability of material for publication, the general state-of-the-hobby, and other factors that cannot be as easily defined as those I have mentioned here. Each year I asked myself the question "Shall we continue CNL for another year?" And each year, until 1996, the answer was "Yes" - - in January of 1996 the answer was "No!".

As long as my health remained good I was determined to continue, but in December of 1995 I underwent an electric-cardioversion to correct a a serious heart-beat irregularity that had been developing slowly over the past several years. The procedure was successful but the medications necessary to keep it that way have caused a substantive reduction in my energy levels and the prognosis is that I must continue those medications for the foreseeable future. Accordingly, I decided to retire as Editor and Publisher of CNL.

I had retired from my formal profession as an Electronic Engineer in the Aerospace industry in 1985 and that change gave me the opportunity to devote some additional time to CNL which has always been a volunteer spare-time as-time permits activity. Other demands on my time, especially the desire of my wife and I to travel while we were still healthy enough to do so as well as my principal hobby activity of development of MIDI musical scores for choral groups, continued to keep us exceptionally busy.

Having made the NO decision, I decided to offer CNL as a donation to The American Numismatic Society (ANS), of which I am an Associate Member, to serve as the journal for a (possible) Special Interest Group devoted to the subject of "Early American Coins and Paper Money Before 1793." To my surprise and great delight the Society accepted my offer.

Accordingly, the final issue of CNL sponsored by CNLF will be Issue No. 103 dated September 1996, and the first issue sponsored by ANS will be Issue No. 104 dated April 1997. The Foundation also plans to issue a revised Cumulative Index covering Issues No. 1 through 103 in October, 1996.

Again - **Thank You for your support** and also for your **continued support** of CNL under the direction of the ANS and our new editor Dr. Philip L. Mossman. **JCS**

-30-

As a matter of record in this final CNLF issue of CNL, we are printing on the next several pages the formal ANS Press Release announcing the donation of CNL to the ANS and, in addition, the contents of a Memorandum of Agreement detailing additional information concerning the donation:

>>>>>>

Press Release

**CNL Donated to
the American Numismatic Society**

The Colonial Newsletter, considered the premier journal in the field of American Colonial coinage and currency, has been donated to the American Numismatic Society. Arthur A. Houghton III, ANS President, noted that the New York based research organization is "proud, honored, and extremely grateful to have been chosen as the recipient of this highly prestigious publication"; formal acceptance of the gift was recorded at the meeting of the Society's governing Council on July 20.

James C. Spilman, President of the Colonial Newsletter Foundation located in Huntsville, Alabama, earlier this year notified ANS Director Leslie A. Elam of his decision to retire as Editor of CNL, a position he has held since 1963. Through Mr. Elam, the ANS expressed its great interest in assuming responsibility for the production and distribution of CNL beginning in 1997, and the donation was finalized at the end of June.

Mossman New Editor

The new Editor of CNL will be Dr. Philip L. Mossman of Hampden, Maine, who now serves as one of three Associate Editors of the journal, the others being Gary Trudgen of Endwell, New York and Michael Hodder of Wolfeboro, New Hampshire, all of whom are also frequent contributors to the pages of CNL. Dr. Mossman recently retired as Director of Rehabilitation at the Eastern Maine Medical Center in Bangor. In 1993, the Society published his monumental study, *Money of the American Colonies and Confederation* as ANS Numismatic Studies 20; a critically acclaimed work cited in 1994 for special awards by the Sons of the American Revolution and the Numismatic Literary Guild. Associate Editors Trudgen and Hodder have agreed to continue providing their important services to production of the journal under ANS sponsorship.

CNL was established in 1960 by Alfred D. Hoch to "provide in permanent form an exchange of information, opinions, and discoveries concerning Early American coins and currency." Mr. Spilman became the Editor/Publisher of CNL in August 1963, with issue no. 9. In 1995, issue 100 was celebrated by publication of an even dozen articles of original research in early American numismatics together with a series of fitting tributes to a publication which has emerged over the years as the principal means of communication among those working in pre-Federal American numismatic research. Issue 103, due later this year, will be the last bearing the name of "ye Editor" James C. Spilman on the masthead, who will assume the new title of Editor Emeritus. The first ANS issue, no. 104, will appear in April 1997.

The ANS, founded in 1858, is one of the oldest learned societies in the United States. Its collections and library are among the largest and most comprehensive in the world and provide the basis for the Society's long-standing commitment to numismatic research and education at all levels. The ANS is generally considered the largest non-profit publisher of numismatic works, issuing books, periodicals and catalogues in several series, including the *Proceedings* volumes of the annual *Coinage of the Americas Conference*, initiated in 1984. Acquisition of CNL will further strengthen the Society's commitment to and participation in early American numismatics.

—END—

Leslie A. Elam
American Numismatic Society
New York

Elam@AmNumSoc.Org

>>>>>>>>

MEMORANDUM OF AGREEMENT

At the invitation of James C. Spilman, President, The Colonial Newsletter Foundation, Inc. (CNLF) and Editor, The Colonial Newsletter (CNL), Dr. Philip L. Mossman, Associate Editor, CNL, and Leslie A. Elam, Director, American Numismatic Society (ANS), traveled to Huntsville, AL, June 28-30, 1996, to discuss the future of CNL. Mr. Spilman, Editor of CNL since August 1963, has decided to divest himself of that responsibility at the end of 1996. Through Mr. Elam, the ANS expressed interest in assuming responsibility for the production and distribution of CNL.

1. Mr. Spilman, on behalf of the CNLF, offers all right, title and interest in CNL to the ANS, to produce and distribute under copy-right of the ANS, subject to the terms and conditions herein described.

2. At its meeting of July 20, 1996, the Council of the American Numismatic Society accepted the offer described in 1. above, recording in its Minutes, page 10: "On motion, duly made and seconded, Mr. Elam was directed to inform Mr. Spilman that the ANS is proud, honored and extremely grateful to accept the donation of the CNL under the terms outlined in the "Memorandum of Agreement". The Council agrees that the "Memorandum of Agreement" which governs this conditional donation is that agreed to by James C. Spilman, President, The Colonial Newsletter Foundation, Inc. and Leslie A. Elam, Director, American Numismatic Society, as attested by their signatures to this document.

3. The ANS agrees to continue to edit, publish and distribute CNL at the rate of at least three issues per calendar year, for an initial period of three years (the "experimental period"). Dr. Mossman offers to serve as Editor with the responsibility for soliciting, reviewing and editing copy for each issue; Gary

Trudgen offers to continue his role as Associate Editor with responsibility for composition and formatting pages for the printer. The ANS will assume responsibility for: overseeing the content and editorial integrity of CNL, including maintenance of standards established over the years by Mr. Spilman; maintaining the mailing lists and distributing CNL; collecting fees and subscriptions; appointing personnel, paid or unpaid, as it deems needed to meet its responsibility for production of CNL; meeting the expenses of production and distribution, including reimbursement of expenses incurred by Dr. Mossman as Editor of CNL and continuation of the present arrangement to remunerate Mr. Trudgen for preparation of camera ready copy, any and all payments to be subject to prior agreement by the ANS.

4. During the "experimental period," The CNLF will continue as a separate entity with the objectives of providing limited financial support of CNL, and to the continuation of other CNLF research objectives. However, the CNLF will not institute or issue a print publication similar in nature to CNL.

5. The ANS will, at its discretion, determine the distribution of CNL, and the fees and subscriptions charged for CNL, except that the ANS will honor prepaid subscriptions to CNL and will continue to offer a separate subscription to CNL not conditioned upon membership in the ANS. Mr. Spilman has delivered to the ANS the complete, current subscription list for CNL, comprising its "Patrons," many of whom donate amounts in addition to the annual subscription. Mr. Spilman will refer future inquiries and subscriptions received by him to the ANS for fulfillment.

6. The ANS will consider establishing a Special Interest Group (SIG) to identify those members and subscribers having an interest in "Early American Coins and Paper Money Before 1793." This SIG would initially have, in common, readership of CNL. The ANS will consider other means to foster greater awareness of the Society's collections and library in

this area, and to promote better communication and fellowship among members of the SIG.

Agreed to by the parties signing hereto on behalf of the organizations named in this Agreement.

7. At the end of the three year "experimental period," the ANS will inform the CNLF whether the ANS will continue ownership of CNL or donate it back to the CNLF. Should the ANS decide to continue ownership and production of CNL, the CNLF will donate to the ANS, subject to acceptance by the ANS in whole or in part, the numismatic collection and library of the CNLF.

Signed and dated 31 July 1996

Leslie A. Elam, Director
American Numismatic Society

James C. Spilman, President
Colonial Newsletter Foundation

